

The following information, presentations, suggestions, and options represent the expertise and knowledge of the consulting team hired by the Department of Ecology on its oil transportation study and should be considered pre-decisional discussion points. This information was developed, at the request of Ecology, to solicit ideas and generate discussion at the expert's panel meetings Aug. 5 & 7, 2014.








# **Marine and Rail Oil Transport Study**

**Dagmar Schmidt Etkin, PhD**  
*Environmental Research Consulting*

ENVIRONMENTAL RESEARCH CONSULTING

# Study Team

Company	Team Member	Roles	Education	Years
<b>ERC</b> 	<b>Dagmar Etkin</b>	Project Manager; Report Writer; Presenter; Risk Analyst	PhD Ecology	40
<b>SEA Consulting Group (SEA)</b> 	<b>Ann Hayward Walker</b>	Stakeholder/Government Workshops; Outreach	MBA Management	37
	<b>John Joeckel</b>	Response/Preparedness Expert Maritime Expert	BS Marine Transportation	35
	<b>Debra Scholz</b>	Workshop Development Contingency Planning/Training Expert	MS Marine Science	25
<b>Herbert Engineering Corp. (HEC)</b> 	<b>Colin Moore</b>	Maritime Expert/ Vessel Traffic Analyst	PhD Naval Architecture	37
	<b>Cameron Baker</b>	Marine Engineer/ Naval Architect	BS Naval Architecture	7
<b>MainLine Management, Inc. (MLM)</b> 	<b>Dave Hatzenbuhler</b>	Railroad Operations Expert	BS Political Science	42
	<b>Robert Patton</b>	Railroad Systems Expert	BS Management	37
	<b>Eric Lyman</b>	Railroad Operations Expert	BS Civil Engineering	34
<b>The Culpepper Group</b> 	<b>Dave Culpepper</b>	Asst. Project Manager; Spill Response Expert; HAZMAT Expert	BS Physical Geog.	31

# Washington Experience

Category	Projects	Member
Oil Spill Risk & Response	JLARC Spill Preparedness Funding Mechanism 2008	ERC
	Risk Analysis for Spill Prevention/Preparedness (Ecology) 2008	ERC
	Spill Risk by Transport Mode (PHMSA) 2005	ERC
	Analysis Vessel Spills/Casualties (Ecology) 2001	ERC
	Hydrodynamic Analysis for Oil Transfer Regs (Ecology) 2006	ERC
	Spill Response Cost-Benefit Analysis (Ecology) 2003 - 2006	ERC
	Spill Response Vessel Capabilities (Ecology) 2005	ERC
	Oil Transfer Reg Benefit Analysis (Ecology) 2005	ERC
	Tug Escort Study Puget Sound (Ecology) 2005	ERC
	Discharge Analysis for Contingency Planning Stds (Ecology) 2003	ERC
	Reg Assessment: Tugs in Puget Sound (USCG) 1999	HEC



# Washington Experience

Category	Projects	Member
Marine Spill Risk	GPT Vessel Traffic Risk (SSA Marine/Ecology) 2012	ERC
	BP Cherry Point Vessel Traffic (USACE) 2013	ERC
	BP Cherry Point Dock EIS (USACE) 2006 – 2014	ERC
	Dispersant Ecological Effects Puget Sound Workshop (USCG) 1998	SEA
	Pacific Northwest Oil Spill Open House (USCG) 2013	SEA
	Roberts Bank Terminal/Port Metro Vancouver 2013-2014	HEC/ERC
Rail Spill Risk	WA Public Ports Assoc. Cargo Forecast/Rail Capacity since 1994	MLM
	Vancouver WA Terminal Expansion (POV)	MLM
Spill Remediation	Soil and Groundwater Remediation in WA since 1980s	TCG



# General Study Approach

- Ecology research beginning in 2011
- ERC Team contracted end of June 2014
- ERC Team research (with Ecology, EMD, UTC) July 2014
- ERC Team meets with other Experts (5-7 August 2014)
- ERC Team presents draft findings/recommendations to Ecology for review 22 August 2014, then to Governor
- ERC Team conducts stakeholder and government-to-government workshops 8-12 September 2014
- ERC Team presents technical report to Ecology 15 October 2014
- After review ERC Team sends report to Governor 1 December 2014
- Additional outreach meetings in January 2015
- Revised report to Governor in March 2015

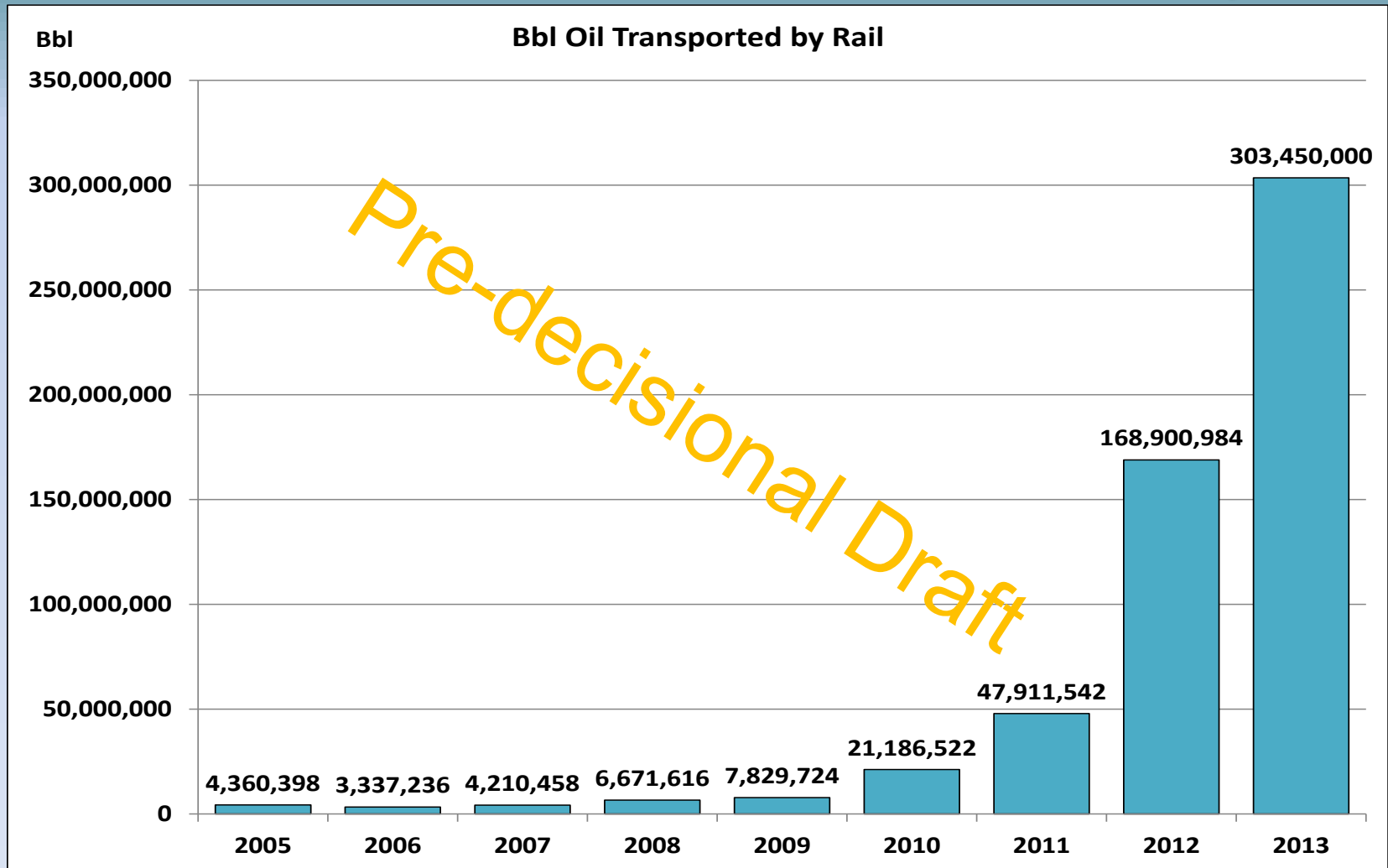


# Objectives for this Meeting

- Brief review of changing conditions with CBR, including communities and resources at risk
- Group discussion/expert input on risk concerns
- Development of potential consensus-based summary of risk concerns for consideration in presentation to Governor
- Brief ERC Team presentations on preliminary findings and potential risk mitigation options
- Group discussion/expert input on options for risk mitigation
- Evaluation and ranking of options by importance, effectiveness
- Discussion of potential funding mechanisms
- Development of potential consensus-based summary of risk mitigation options for consideration in presentation to Governor



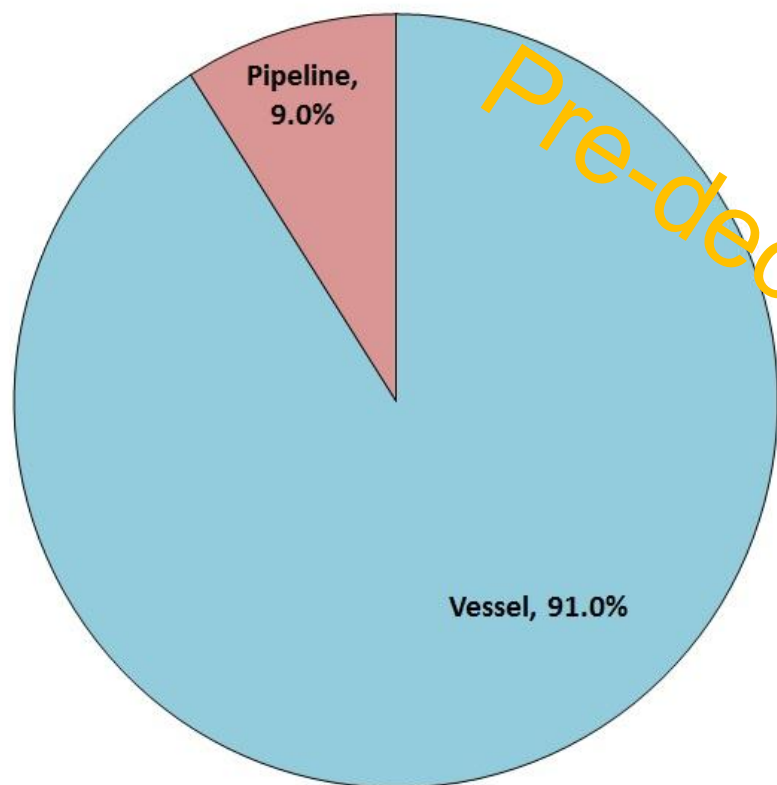
# National Increase in CBR Transport



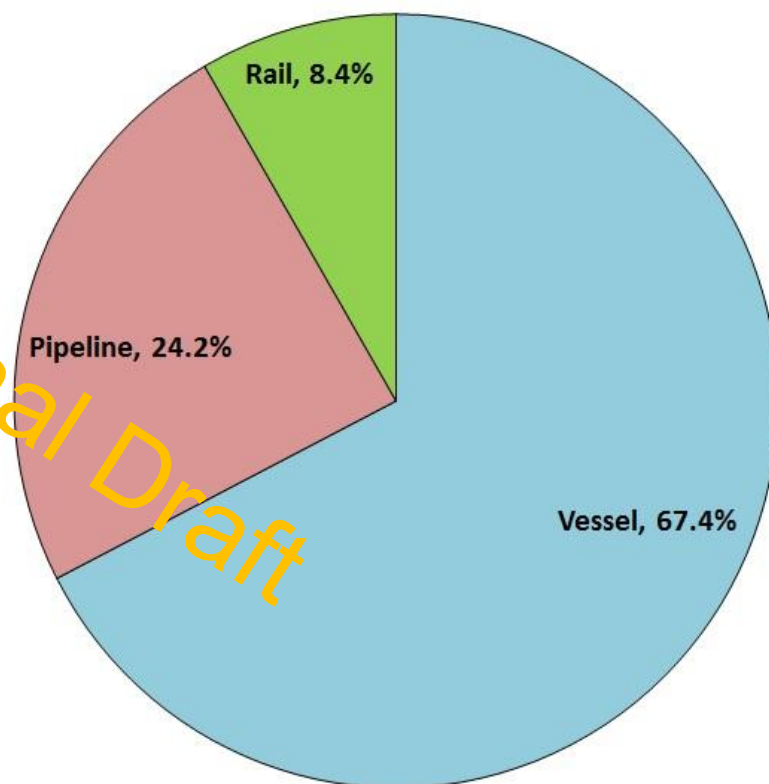


# Change in Crude Imports into Washington

Percent Oil Transport to Washington State by Mode - 2003



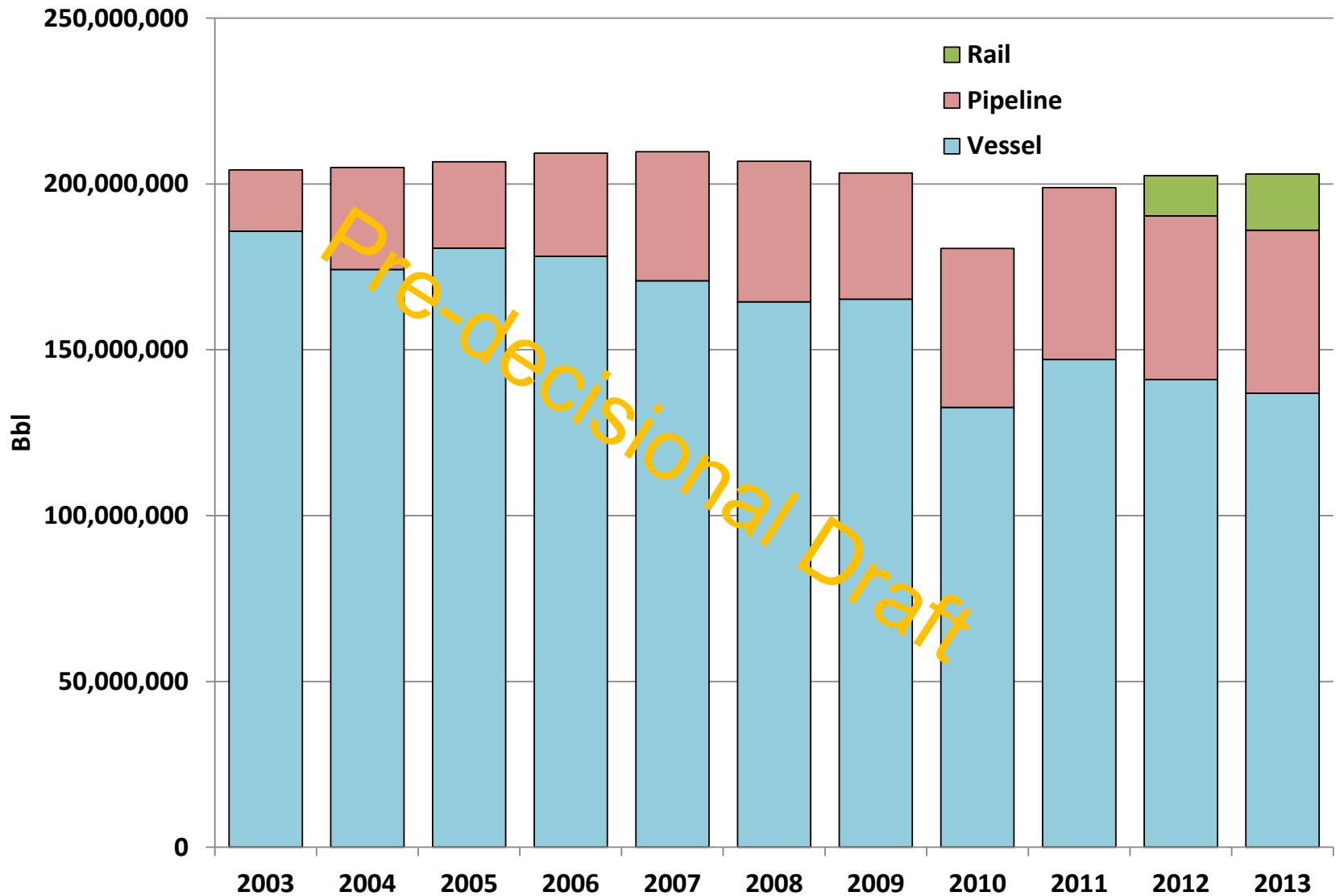
Percent Oil Transport to Washington State by Mode - 2013



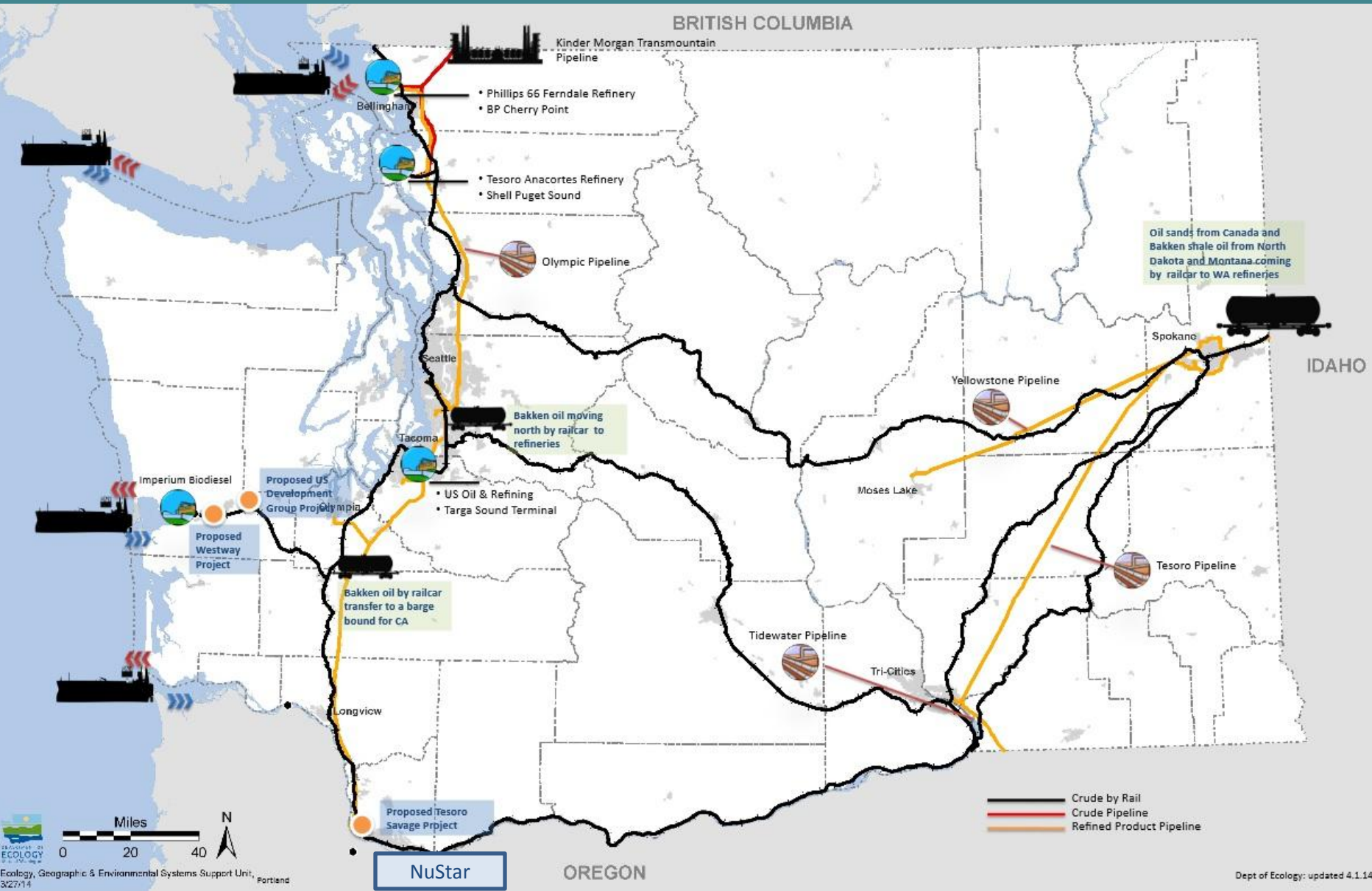
Pre-decisional Draft



## Oil Imports to Washington State by Mode (2003 - 2013)



# BRITISH COLUMBIA




  
 Ecology, Geographic & Environmental Systems Support Unit,
   
 3/27/14
   
 Portland

Dept of Ecology: updated 4.1.14

# Significant Changes in WA

- Transport of crude oil by rail (CBR)
- Shift from vessel transport to rail and pipeline
- Proposed CBR transfer/storage facilities in Columbia River, Grays Harbor
- Potential tanker/tank barge traffic in Grays Harbor, Columbia River
- New type of oil (Bakken crude) transported
- More diluted bitumen transported (by rail/vessel)
- Increases in transport of pressurized, cryogenic gas
- Potential for more future crude export domestically and internationally



# Current Crude Oil Trains through WA

- 19 loaded trains passing through per week (BNSF data)
- About 988 loaded trains per year
- About 98,800 CBR loaded tank cars per year
- About 2.9 million gallons oil per train
- About 2.87 billion gallons oil per year

## Potential Future

- Potential increase in CBR traffic to 90 loaded trains weekly at full build-out of proposed facilities
- Tankers and ATBs loading at CBR facilities



# “New” Kinds of Crude Oil

## Diluted Bitumen

- From Alberta, Canada
- AKA “tar sands oil”, “dilbit”
- Heavy
- May sink in water
- Variable flammability
- Persistent
- Variable toxicity
- Transported into WA for decades

## Bakken Crude

- From North Dakota
- Very light
- Volatile
- Lower flash point
- Potentially explosive, flammable
- Higher toxicity (for crude)
- Not persistent
- New crude on market





# Risk

Risk = Probability x Consequences (Impacts)

Prevention addresses Probability

Preparedness/Response address Consequences

